

REMARKS

Claims 1-13 are pending in the application with claim 1 in independent form. By the present preliminary amendment claims 1 and 12 have been amended.

Applicants wish to acknowledge the Examiner's indication of allowance of claim 3 if rewritten in independent form including all the limitations of the base claim and any intervening claims, however, Applicants do not wish to so amend claim 3 at this time.

The Examiner rejected claim 12 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated "The specification fails to disclose the addition of the polyisocyanate to the claimed compositions; rather, the specification states that the polyisocyanate is used in the production of the claimed compositions. Therefore, it is not seen that support exists for stating that the polyisocyanate is essentially an additive for existing compositions."

By the present amendment claim 12 has been amended to claim a paint, a varnish, a coating, an adhesive, a sealant, a pourable elastomer, or a foam comprising a high functionality polyisocyanate prepared as claimed in claim 10. By the present amendment Applicants believe they have overcome the Examiner's rejection and request removal of the rejection.

The Examiner rejected claims 1, 2, and 4-13 under 35 U.S.C. § 102 (b or e) as anticipated by or, in the alternative, under 35 U.S.C. § 103 (a) as obvious over Bauriedel ('709) or Bolte et al. ('164). The Examiner takes the position that the abstract and columns 2-5 within Bauriedel disclose preferred ratios of initial hydroxyl groups to initial isocyanate groups that would yield Applicants' claimed addition product (A). The Examiner points to the abstract and

columns 2-4 of Bolte et al. as disclosing Applicants' claimed addition product (A). The Examiner states "The position is taken that when the disclosed trifunctional or higher polyols are used at the disclosed ratios, the disclosed processes anticipate applicants' process and high-functionality polyisocyanate." The Examiner furthermore states "However if it is determined that the references fail to be anticipatory due to the fact that diols are also disclosed, the position is taken that it would have been obvious to one seeking increased functionality isocyanates to utilize the disclosed increased functionality polyols while operating within the disclosed preferred index ratio range". The Examiner insists that the disclosed processes in the two cited references encompass scenarios where only a single hydroxyl groups remains after step 1. The Examiner points to column 3, line 45 of Bauriedel for support for this position. The Examiner also takes the position that the references recitations of plural hydroxyl moieties refers to the reaction mass and not to individual product molecules.

Claim 1 has been amended to recite that it is a process for preparing high-functionality polyisocyanates having at least three free isocyanates groups and that the addition product (A) from step (i) or the poly addition product (P) from step (ii) are subsequently reacted through their one remaining isocyanate reactive group with a diisocyanate or a polyisocyanate II to form a high-functionality polyisocyanate having at least three free isocyanate groups. Claim 1 furthermore requires that the addition product (A) or the poly addition product (B) are compounds that contain only a single isocyanate reactive group and at least two free isocyanate groups.

Bauriedel is concerned with producing adhesives based on polyurethane prepolymers having a low residual monomer content. As discussed in the abstract this is accomplished by reacting polyhydric alcohols initially with a faster reacting isocyanate group of an asymmetrical diisocyanate with the slowly reacting isocyanate group remaining intact. In a second step the reaction products from the first step are combined with a symmetrical diisocyanate having equally reactive isocyanate groups that react more quickly with any remaining isocyanate reactive groups than the slowly reacting group of the first diisocyanate. Bauriedel only discloses use of diisocyanates, no tri or higher functional isocyanates. The Examiner is again directed to column 2, lines 11-27 and 57-64. It is clearly stated in column 2 that this reaction is carried out in such a way that the number of OH moieties to NCO groups is in a ratio of from 0.55 to 4 OH groups for every NCO group. In addition it is stated that the first step is carried out until virtually all of the faster-reacting of the two isocyanate moieties have been reacted with OH moieties to form the first stage prepolymer having a substantial number of free OH moieties attached through the alcohol nucleus. In addition it is stated that the less reactive NCO moieties from the first diisocyanate are not allowed to react at all with any of the available OH moieties. The ratios disclosed in Bauriedel are not molar ratios but are number ratios. Since the source of the NCO groups is an asymmetrical diisocyanate that means that in reality only half of the actual NCO groups are available to react with any of the OH groups. Thus, even at the lowest ratio of 0.55:1 there are more OH groups available than there are reactive NCO groups that can react with the OH moieties. In addition, at any of the ratios stated in Bauriedel because a diisocyanate is being utilized it would not be possible following the disclosure of Bauriedel to

generate a compound as required in step (i) of claim 1 of the present invention. Especially if a diol is used. In the present invention a diol requires use of a tri-functional or higher polyisocyanate. No such polyisocyanates are disclosed in Bauriedel. Bauriedel discloses in column 3 exactly what would happen in his disclosed system when utilizing a diol in the reaction with the diisocyanate in the first stage namely one would have a product having one unreacted isocyanate moiety and one unreacted hydroxy moiety. This compound does not meet the requirements of claim 1 which requires that the addition product (A) or the polyaddition product (P) each contain only one isocyanate reactive group and at least two free isocyanate groups. This product from the present claim is subsequently reacted through the isocyanate reactive group with an additional diisocyanate or polyisocyanate II to form a high-functionality polyisocyanate having at least three free isocyanate groups.

Bauriedel gets even further from the present invention when one begins with a triol being reacted with the diisocyanate in the first step. In this instance the only way to meet the limitations of the present claim utilizing a diisocyanate is to have a **molar ratio** of diisocyanate to polyhydric alcohol of at least 2 to 1, which means that the ratio of OH to NCO moieties would be 3:4 which is outside the range disclosed by Bauriedel. In summary, the disclosure of Bauriedel neither anticipates nor makes obvious claim 1 of the present invention and therefore the rejection of this claim and the claims which depend therefrom, under 35 U.S.C. § 102 or 103 based on Bauriedel is improper and must be withdrawn.

Bolte et al. is very closely related to Bauriedel and in fact, as has been stated before, whole sections of Bolte et al. are direct repetitions of the language found within Bauriedel. The

distinguishing characteristic of Bolte et al. as stated in its abstract and summary of the invention is that the ratio of the NCO groups of the partly slower-reacting diisocyanate used in the first step to the NCO groups of the faster-reacting diisocyanate used in the second step is greater than 6:1. Thus in Bolte et al. the first stage of the reaction is carried out with an asymmetric diisocyanate and the second stage of the reaction is also carried out with a diisocyanate wherein the amount of the diisocyanate utilized in the first reaction is at least six fold higher than that utilized in the second reaction. Just as with Bauriedel, there is no disclosure of use of any isocyanates other than diisocyanate. As stated in column 3 of Bolte et al. in the first reaction step the diisocyanates containing the NCO groups with differing reactivity are reacted with the polyhydric alcohols in a OH:NCO moiety ratio of from 4 to 0.55:1 until virtually all of the fast reacting NCO groups have reacted with a few of the OH groups and none of the slow reacting NCO group has reacted. In a second step a symmetrical diisocyanate is then reacted with the product from the first step **in a less than equivalent quantity** based on the free OH groups. In column 4 Bolte et al. states that in the second stage of the reaction the molar ratio of OH groups divided by the isocyanates groups in the second diisocyanate is preferably from 1.1 to 12. Thus, the product produced according to Bolte et al. will always be a product wherein there are free OH groups even after the second stage of the reaction. This is completely unlike the present invention wherein claim 1 requires that the product produced by the first reaction be one having at least two free isocyanate groups and only one isocyanate reactive group. In the second step this isocyanate reactive group is reacted with a diisocyanate or a polyisocyanate II to produce a product having at least three free NCO groups. The product produced according

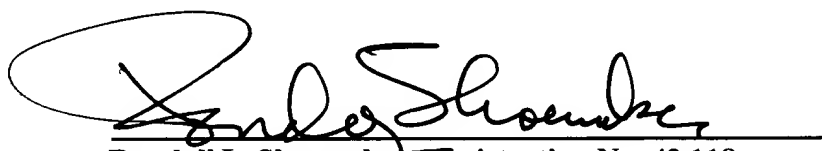
to the present invention has no free isocyanate reactive groups unlike that of Bolte et al. The products are simply completely different products. Bolte et al. emphasizes repeatedly the use of the non-symmetrical diisocyanate in the first step and a symmetrical diisocyanate in the second step wherein the reaction ratios of OH:NCO groups are guaranteed to produce a product that does not meet the limitations of claim 1 of the present invention. The same is true of the product of the second step, which does not meet the product as defined in claim 1 of the present invention. In summary, claim 1 of the present invention includes limitations neither found in nor made obvious by the disclosure of Bolte et al. thus the rejection of this claim, and the claims which depend therefrom, under 35 U.S.C. § 102 or 103 based in Bolte et al. is improper and must be withdrawn.

Applicants' attorney respectfully submits that the claims as amended are now in condition for allowance and respectfully requests such allowance.

Respectfully submitted,

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Date



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I hereby certify that the enclosed Amendment, Petition and fee are being deposited with the United States Postal Service, as Express Mail, Label No. EL 826404582 US postage prepaid, in an envelope addressed to Mail stop Box RCE, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on **May 28, 2004**.

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